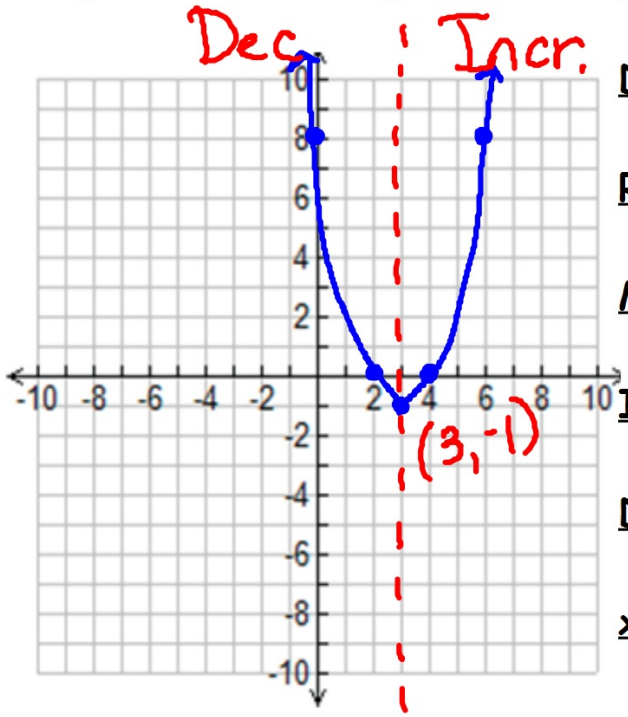
Bellwork: 11/8/12

Analyze the following quadratic graph:



Domain: $(-\infty, \infty)$

Range: $[-1, \infty)$

Max/Min: $(3, -1)$

Increasing: $(3, \infty)$

Decreasing: $(-\infty, 3)$

x-intercepts: $(2,0)$ & $(4,0)$

y-intercepts: $(0,8)$

Unit 2: Chapter 4 - Quadratic Functions:

Section 4.1 - Graphing Quadratics in VERTEX Form

VERTEX Form: $y = a(x-h)^2 + k$

****REMEMBER:**

vertex: (h, k)

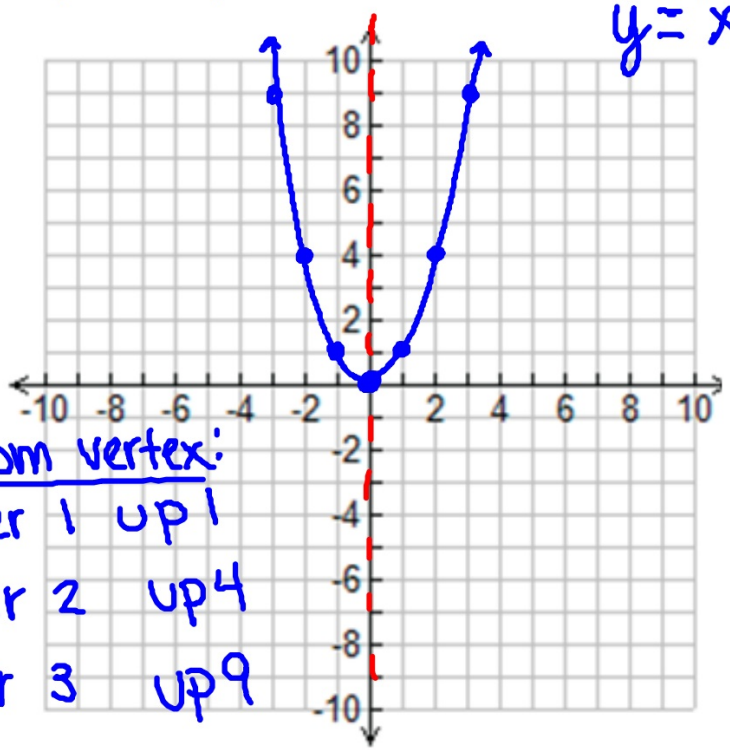
* h is opposite what appears

$(x-3)^2 \rightarrow h = 3$

$(x+3)^2 \rightarrow h = -3$

Graph of a quadratic with vertex at (0,0) and "a" = 1:

$y = x^2$



From vertex:

over 1 up 1

over 2 up 4

over 3 up 9

vertex: (0, 0)

$a = 1$

axis of symmetry: line that cuts graph in half $x = 0$

Domain: $(-\infty, \infty)$

Range: $[0, \infty)$

Graph each of the following quadratic functions:

① $y = -x^2$

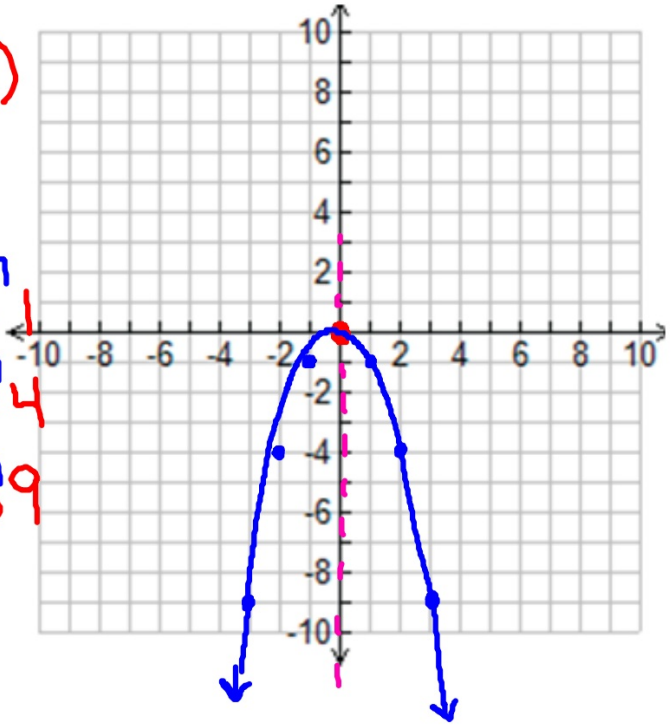
vertex: (0, 0)

$a = -1$

over 1 ~~up~~ down 1

over 2 ~~up~~ down 4

over 3 ~~up~~ down 9



② $y = (x-3)^2 + 2$

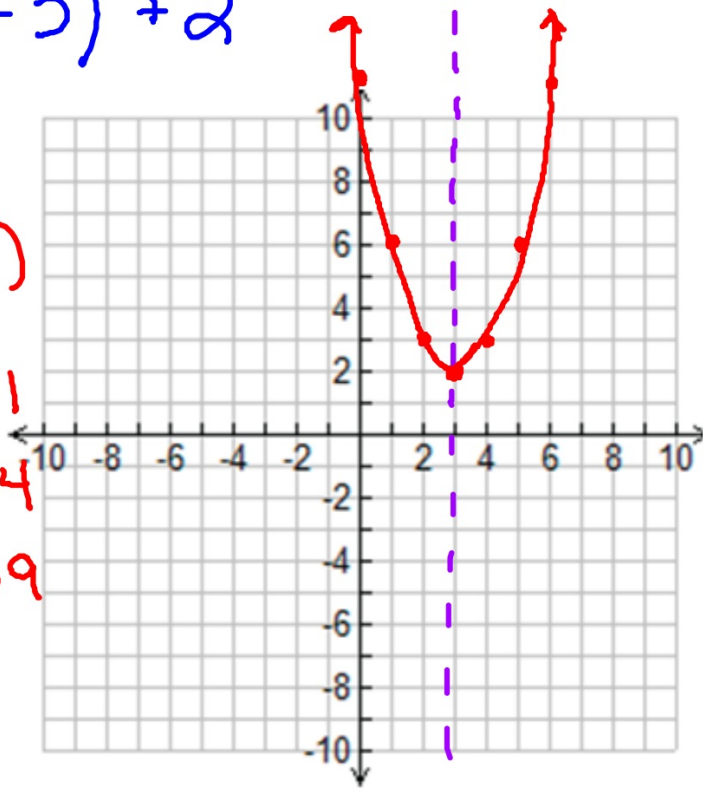
$a = 1$

$(h,k) = (3,2)$

over 1 up 1

over 2 up 4

over 3 up 9



③ $y = (x+4)^2 - 2$

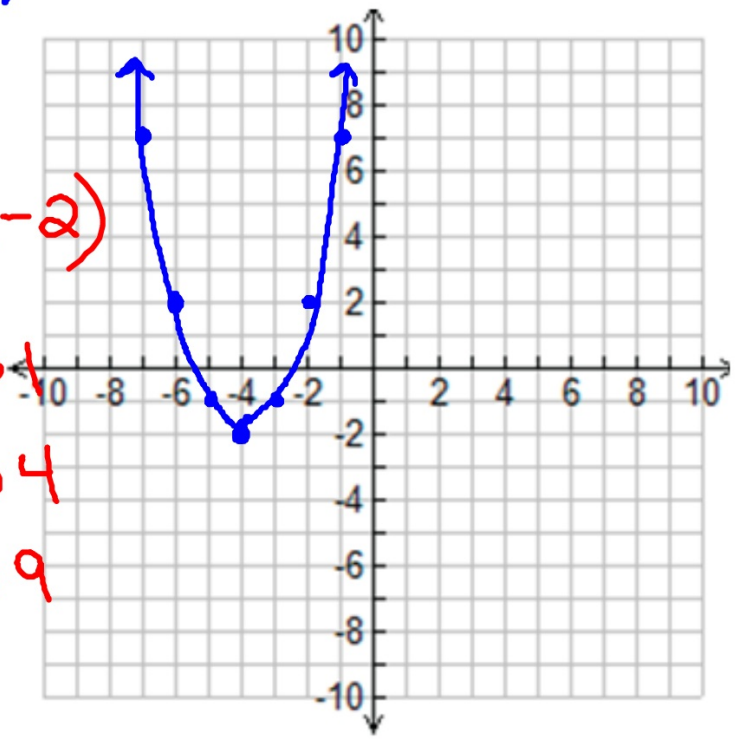
$a = 1$

$(h, k) = (-4, -2)$

over 1 up 1

over 2 up 4

over 3 up 9



(4) $y = -(x-1)^2 - 3$

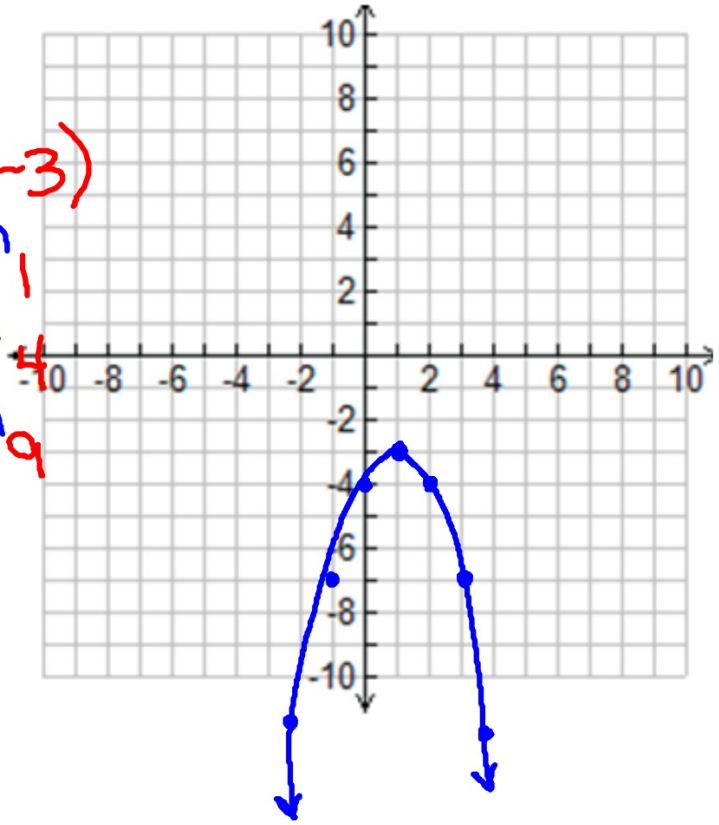
$a = -1$

$(h, k) = (1, -3)$

over 1 ~~up~~ down 1

over 2 ~~up~~ down 4

over 3 ~~up~~ down 9



⑤ $y = 2x^2$

$y = a(x-h)^2 + k$

a affects y

a affects x

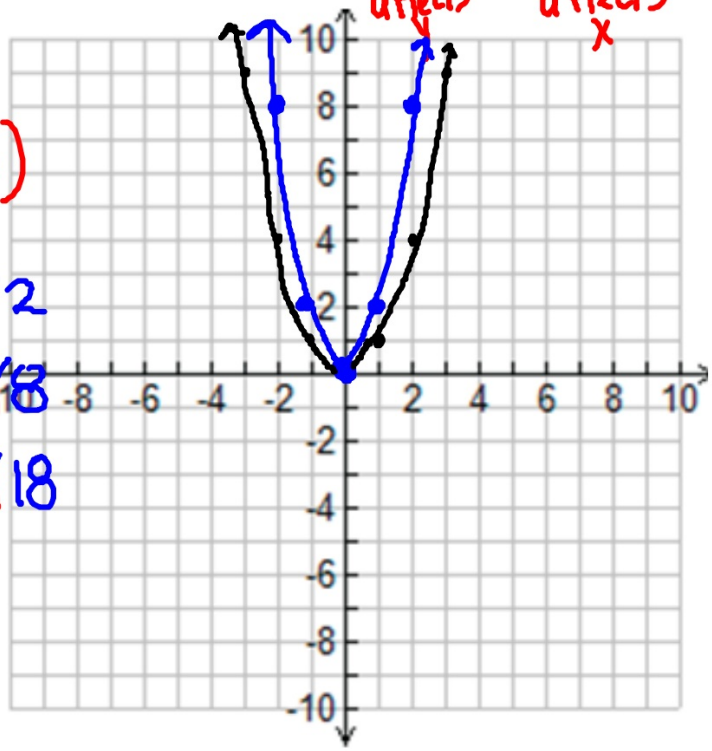
$a = 2$ ups 2

$(h,k) : (0,0)$

over 1 up ~~1~~ 2

over 2 up ~~4~~ 8

over 3 up ~~9~~ 18



⑥ $y = \frac{1}{2}x^2$

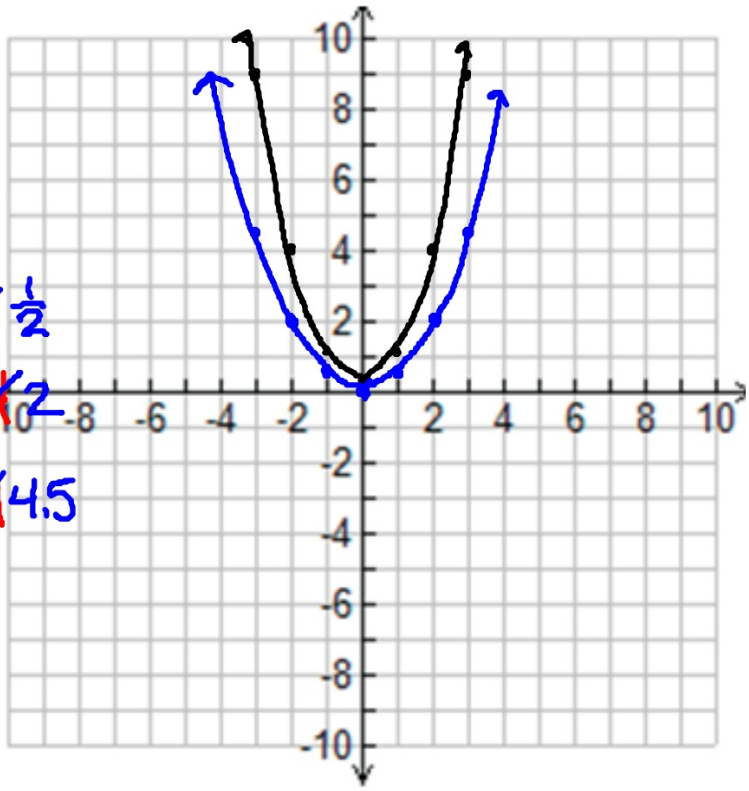
$a = \frac{1}{2}$

(h,k): $(0,0)$

over 1 up ~~1~~ $\frac{1}{2}$

over 2 up ~~4~~ 2

over 3 up ~~9~~ 4.5



① $y = 2(x+1)^2 - 4$

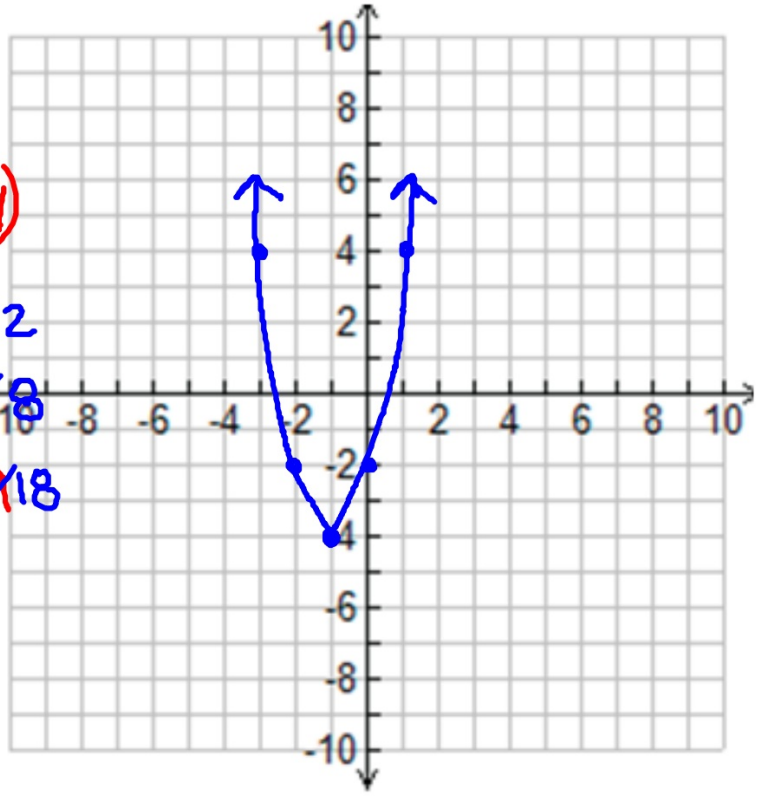
$a = 2$

(h,k): $(-1,-4)$

over 1 up ~~1~~ 2

over 2 up ~~4~~ 8

over 3 up ~~9~~ 18



⑧ $y = \frac{1}{2}(x-2)^2 + 1$

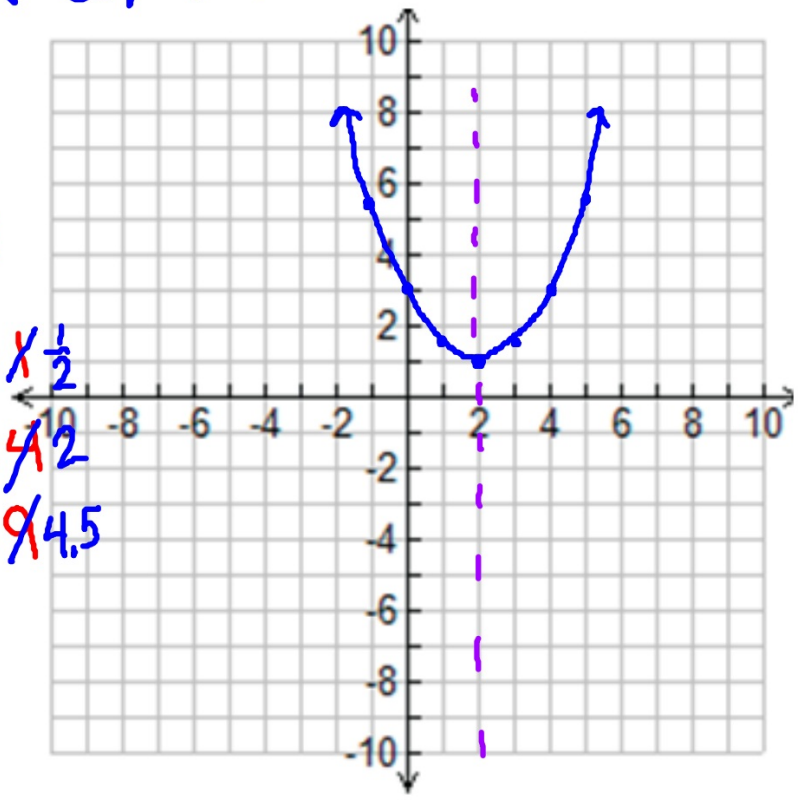
$a = \frac{1}{2}$

$(h,k):(2,1)$

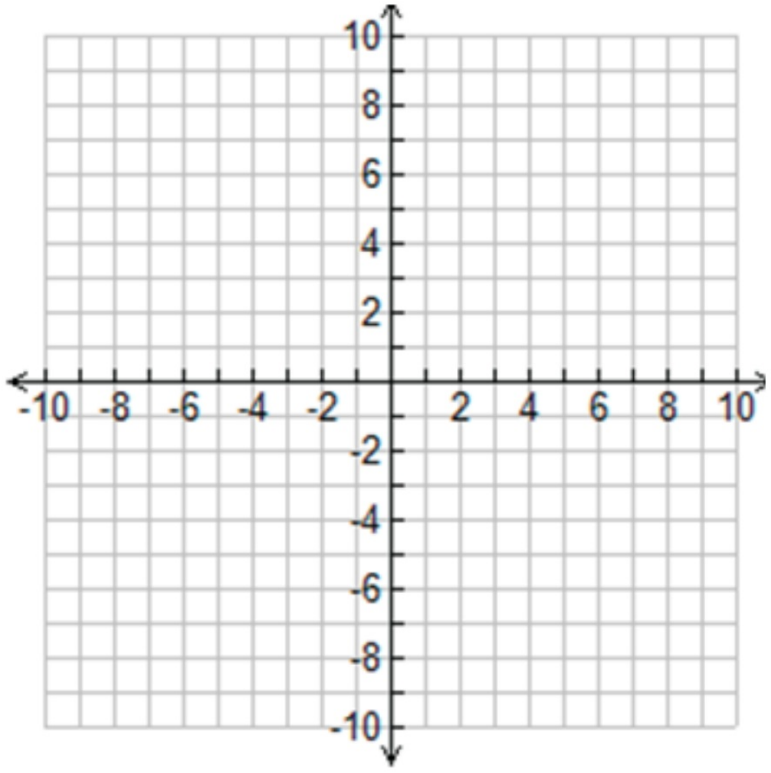
over 1 up ~~1~~ $\frac{1}{2}$

over 2 up ~~4~~ 2

over 3 up ~~9~~ 4.5



⑨ $y = -2(x-2)^2 + 6$



10) $y = -\frac{1}{3}(x+4)^2 + 7$

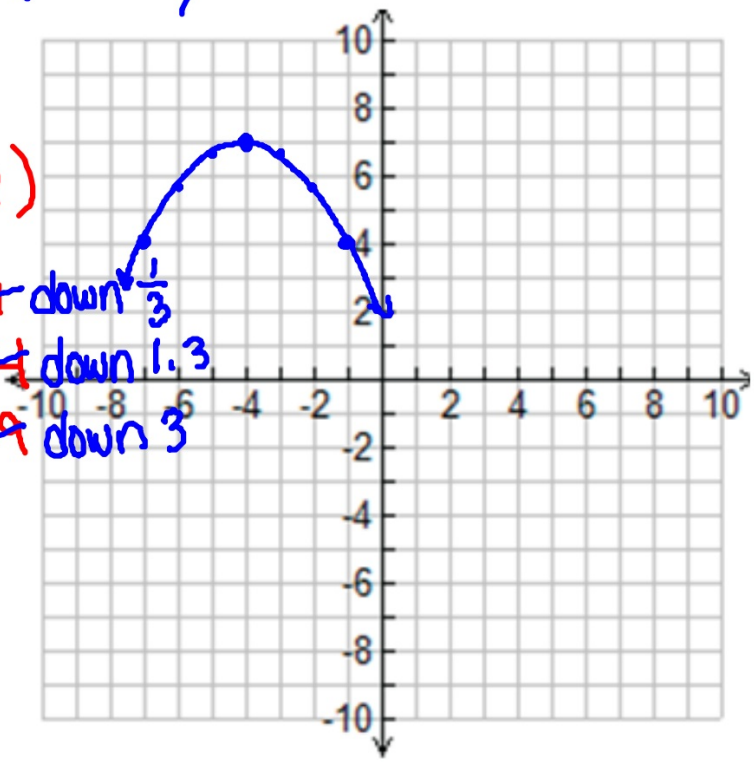
$a = -\frac{1}{3}$

$(h,k): (-4,7)$

over 1 ~~up 1~~ down $\frac{1}{3}$

over 2 ~~up 4~~ down 1.3

over 3 ~~up 9~~ down 3



Homework:

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